mark which is of differing width. It is also assumed that illumination is with broadband light and that the reflected light is analyzed with a wavelength dispersive detector to provide a spectral curve of reflectivity (amplitude and phase) as a function of wavelength. The resulting curve will be similar in some respects to Figures 3 and 4 and can be processed to obtain the same overlay alignment information, as will be readily understood by those skilled in the art. The correctly aligned marks of Figure 2A are assumed to be of substantially constant pitch while two (or more) distinct pitches or spacings are exhibited by the misaligned marks of Figure 2B.

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Figure 3 shows a plurality of peaks of light amplitude at different frequencies or wavelengths (calibrated as a function of 1/pixel which is basically equivalent to inverse wavelength but specifically related by the calibration to multiples of lithographic tool resolution or minimum feature size). Sharp peaks 32 and broad peaks 34 are evident and are dependent on incident geometry, reflectivity and profile of individual lines. In Figure 3, both the sharp peaks and the broad peaks are substantially symmetrical while in Figure 4, substantial asymmetry is evident, particularly in the broad peaks 42 and the sharp peaks 44 of longer wavelength. This asymmetry of peaks in Figure 4 is due to the different spacings caused by misalignment in the composite pattern of Figure 2B but is substantially absent from Figure 3 since the pitch of the marks is substantially constant. Thus, it is seen that the shape of the spectral curve is extremely sensitive to the existence of slight variation in spacing of a periodic structure (which would include features at a plurality of pitches or periodic spacings due to any misalignment) and even small degrees of

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